Physics 5531  Introduction to Solid State Physics  Spring 2016

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Course content: This course will focus on crystalline solids.

- Cohesion and bonding (Simon chapters 5, 6, 7)
- Structure and scattering, reciprocal lattice (Simon chapter 12, 13, 14; Singleton App. A)
- Lattice vibrations: phonons, thermal properties (Simon chapters 8, 9, 10)
- Electrons in solids (Singleton chapters 1, 2, 3, 4, 5; Simon chapters 2, 15, 16, 17)
- Additional topics, as time permits, selected from: magnetism, superconductivity, 2-D systems

Grading: Course grades will be based on three contributions:

- Assignments 50%
- Mid-term exam(s) 20%
- Final exam 30% (scheduled for Thursday, May 5, at 2 pm)

(Approximate letter grade scale: > 85% = \{A, A-\}; > 70% = \{B-, B, B+\}; > 55% = \{C-, C, C+\}; > 45% = \{D, D+\})

Satisfactory homework solutions must include complete development of the mathematical aspects and brief English explanations of the reasoning that guides your method of solution. While explaining the overall reasoning in this way is sometimes challenging, it is a useful learning tool: you need to step back and understand in the larger context exactly what it is you are doing, and why.

A set of computer programs will be made available along the accompanying guidebook: (Simulations for Solid State Physics by Silsbee and Dräger). Some assignments may call for you to use these simulations. The programs are also available from:

http://pages.physics.cornell.edu/sss/

Disabilities Individuals who have any disability, either permanent or temporary, which might affect their ability to perform in this class are encouraged to inform the instructor at the start of the course. Adaptation of methods, materials, or testing may be made as possible to provide for equitable participation.
Miscellaneous policies The information in this syllabus is intended as a guide. The instructor may adjust course requirements and policies outlined here as deemed necessary. Such changes will be posted. The following University policies are also applicable: Student Conduct Code, Teaching and Learning Responsibilities, Academic Integrity, Excused Absences, Final Exams, Appropriate Use of Course Materials, or visit [http://www.d.umn.edu/vcaa/SyllabusStatements.html](http://www.d.umn.edu/vcaa/SyllabusStatements.html) for links to these policies.